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Scientific Aids in Proof

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ceivable and inventory are desirable.⁸⁵

Although accountancy is not an exact science, it must be recognized that it is founded upon "certain fundamental principles which are universal and immutable and which give recognition to the fact that there is only one truth in everything and no half truth, or quarter truth, or approximations of the truth."⁸⁶

ROBERT A. KLEIN.

SCIENTIFIC AIDS IN PROOF.

A legal philosopher¹ points to the faithful reconstruction of past events as the basis for just determinations. Under our system of trial by jury, however, such reconstructions rank as rare phenomena. There are at least four obvious reasons for this. First, a substantial portion of the fact-materials available for this task may not be presented to the jury.² Second, the main, and often the sole, liaison between the past event and the present trial is oral testimony. Such a connection, constructed of imperfect observation, faulty recollection,

accounts receivable, inventory, and surplus. The author of the falsifications was an employee of Homes & Davis, the auditors of Interstate Hosiery. One of the questions was whether the management of Interstate Hosiery should have discovered the gross overstatements of their position in the financial reports submitted to them by the auditors. The S. E. C. held that the management should have a general conception of its financial position so that it would recognize, for example, the overstatement in its cash position of almost 161%. Said the Securities and Exchange Commission, "The fundamental and primary responsibility for the accuracy of information filed with the Commission and disseminated among investors rests upon management. Management does not discharge its obligations in this respect by the employment of independent public accountants, however reputable."

N. Y. Times, Jan. 31, 1939, p. 35, col. 1: P. A. Benson, President of the American Bankers Association, was reported as urging statutory legislation vesting in auditors the power to demand from corporate managements compliance with specific requirements necessary for accurate and honest accounting. In the Wall St. J., Jan. 18, 1939: reporting that the General Foods Corporation appointed a controller and an assistant controller responsible directly to the board of directors. Suggestions have also been made to rotate the auditors.

⁸⁵ See note 42, *supra*.

⁸⁶ Chairman Korner, Appeal of Goodell-Pratt Co., 3 B. T. A. 30, 34 (1924).

¹ Radin, *The Permanent Problems of the Law* (1929) 15 CORN. L. Q. 1.

² " * * * whatever is relevant is admissible unless it is subject to one or another of the exclusionary principles or rules." Michael and Adler, *The Trial of an Issue of Fact: II* (1934) 34 COL. L. REV. 1462, 1463; 1 WIGMORE, EVIDENCE (2d ed. 1923) § 9; cf. WIGMORE, THE SCIENCE OF JUDICIAL PROOF (3d ed. 1937) § 1.

"To the influence of jury trial may be attributed the most characteristic element of the law of evidence, the exclusionary rules * * *." Rosenthal, *The Development of the Use of Expert Testimony* (1935) 2 LAW & CONTEMP. PROB. 403, 411.

and defective narration, makes for a supply of inferior fact-materials.³ Third, bias and the motive to lie frequently account for the withholding of fact-materials and for the coloring and distortion of those supplied. And, fourth, because of the partisan introduction of expert testimony and the resulting conflict and confusion, the lay jury fail to receive needful assistance in dealing with specialized matters.

There follows a consideration of recent developments in the law of evidence in so far as they tend toward partial amelioration of the situation outlined.

A Trend and a Manifestation.

Perhaps the most commendable feature of modern trial procedure is the shift in emphasis from the artificial rules of admissibility to considerations of relevancy. Learned commentators make uniform report of a general relaxation in the rigor with which the exclusionary rules are being applied.⁴ A greater faith in the intelligence of the jury and a growing realization that "for one case gained by improper proof, ninety-nine have been lost or improperly found on account of the parties being precluded by artificial rules from submitting *all* the facts"⁵ explain the why of this change.

One facet of this changed attitude is reflected in the employment of various devices which help to improve oral testimony. Thus, photographs are held admissible as pictured expressions of facts observed by qualified witnesses.⁶ On the same principle, motion pictures are received in evidence as reproductions of events that have taken place.⁷ Judicial approval has also been extended to the court-

³ WIGMORE, *THE SCIENCE OF JUDICIAL PROOF* (3d ed. 1937) § 215; Radin, *op. cit. supra* note 1, at 4; *cf.* *People v. Gonzalez*, 35 N. Y. 62 (1866).

⁴ "There is even a growing reluctance to invoke in court the rules of exclusion, except where the testimony would be crucial * * *." McCormick, *Tomorrow's Law of Evidence* (1938) 24 A. B. A. J. 507, 581; *cf.* 1 WIGMORE, *EVIDENCE* (2d ed. 1923) § 662; Ladd and Gibson, *The Medico-Legal Aspects of the Blood Test to Determine Intoxication* (1939) 24 IOWA L. REV. 191, 267 (wider admissibility); Morgan and Maguire, *Looking Backward and Forward at Evidence* (1937) 50 HARV. L. REV. 909.

"* * * the judicial rules of Admissibility are destined to lessen in relative importance during the next period of development." WIGMORE, *loc. cit. supra* note 3.

⁵ Lumpkin, J., in *Johnson v. State*, 14 Ga. 61 (1853). Wigmore refers to this " * * * as a sturdy utterance of one of the champions of rationalism in a past generation of judges * * *." 1 WIGMORE, *op. cit. supra* note 4, § 9.

⁶ *People v. Buddensieck*, 103 N. Y. 487, 9 N. E. 44 (1886) (premises); *Alberti v. Ry.*, 118 N. Y. 77, 23 N. E. 35 (1889) (injured limbs); *People v. Smith*, 121 N. Y. 581, 24 N. E. 852 (1890) (personal features); *People v. Cross & Brown Co.*, 232 App. Div. 587, 251 N. Y. Supp. 138 (1st Dept. 1931); *Ryer v. Sheroak Realty Co. Inc.*, 253 App. Div. 924, 2 N. Y. S. (2d) 348 (2d Dept. 1938) (place of accident).

⁷ *Boyarsky v. Zimmerman Corp.*, 240 App. Div. 361, 270 N. Y. Supp. 134 (1st Dept. 1934), reviewed in (1934) 19 MINN. L. REV. 124. *Contra*: *Gibson v. Gunn*, 106 App. Div. 464, 202 N. Y. Supp. 19 (2d Dept. 1923), *aff'd*, 208

room use of photographs⁸ and dictographs.⁹ And twice, recently, talking pictures of confessions were presented before juries.¹⁰ Of significance is the fact that these devices serve a dual purpose: they improve narration; they help to lessen the common defects of faulty memory and observation.

Meeting the Evils of Bias and the Motive to Lie.

A New York court once took judicial notice of the fact that photographs exaggerate—that photographs can lie.¹¹ It has never been necessary for any court to take formal cognizance *that witnesses can and do lie*. A trial judge, however, has charged a jury that the nervous wiping and rubbing of hands by a witness "is almost always

App. Div. 709, 202 N. Y. Supp. 927 (2d Dept. 1923) (would make trial a "farce"), criticized in WIGMORE, 1923-33 SUPPLEMENT § 798 as a "superficial opinion"; cf. *Pacific Mut. Life Ins. Co. of Calif. v. Marks*, 230 Ala. 417, 161 So. 543 (1935) (improper foundation); *State v. United Railways*, 162 Md. 404, 159 Atl. 916 (1932) (dissimilarity of conditions only ground for exclusion); *Mass. Bonding & Ins. Co. v. Worth*, 9 S. W. (2d) 388 (Tex. Civ. App. 1928) (proper exclusion of motion pictures on the ground of immateriality).

In *Feeney v. Young*, 191 App. Div. 501, 181 N. Y. Supp. 481 (1st Dept. 1920), where the moving picture itself was the subject of the controversy, it was held that the best evidence rule did not apply, and it was therefore error to reject the testimony of eyewitnesses to its presentation.

For a list of unreported New York cases in which motion pictures were displayed see Kennedy, *Motion Pictures in Evidence* (1932) 27 ILL. L. REV. 424.

⁸ *Boyne City, G. & A. R. R. v. Anderson*, 146 Mich. 328, 109 N. W. 429 (1906), wherein a phonograph was permitted to be operated in the jury's presence to reproduce sounds claimed to have been made by the operation of defendant's train, the court said: "The ground for receiving the testimony of the phonograph would seem to be stronger [than for receiving testimony for telephone conversation], since in its case there is not only proof by human witnesses of the making of the sounds * * * but a reproduction of the sounds themselves." See 1 WIGMORE, *op. cit. supra* note 4, § 669.

⁹ *People v. Eng Hing*, 212 N. Y. 373, 106 N. E. 96 (1914) (dictograph); *Kidd v. People*, 97 Colo. 480, 51 P. (2d) 1070 (1935) (dictograph); *Andrews v. State*, 15 Ohio C. C. (N. S.) 241, 57 W. L. Bull. 505 (1912) (dictograph); *Commonwealth v. Clark*, 123 Pa. Super. Ct. 277, 187 Atl. 237 (1936) ("speak-o-phone"); cf. *Kilpatrick v. Kilpatrick*, 123 Conn. 218, 193 Atl. 765 (1937) (dictaphone), reviewed in (1937) 26 GEO. L. J. 162.

¹⁰ *People v. Hayes*, 71 P. (2d) 321 (Cal. App. 1937), reviewed in (1937) 17 ORE. L. REV. 72 (stresses the necessity of a proper foundation); *Commonwealth v. Roller*, 100 Pa. Super. Ct. 125 (1930) (treated as a combination of the photograph and phonograph), reviewed in (1930) 78 U. OF PA. L. REV. 565, wherein it is said: "The introduction of said pictures to facilitate trial technique again illustrates the willingness of courts to supplement, clarify, and authenticate verbal testimony by tested scientific processes."

For the procedure to follow in the taking and presenting of such sound pictures, see Scott, *Photography in Criminal Investigations* (1938) 29 J. CRIM. L. 383; so also, Kennedy, *loc. cit. supra* note 7.

¹¹ *Puleo v. Stanislaw Holding Corp.*, 126 Misc. 372, 213 N. Y. Supp. 601 (1926).

an indication of lying."¹² Although rather unsentimental, this statement does indicate some appreciation of the fundamental truism upon which all methods of detecting deception are constructed, *i. e., conscious deception is accompanied by emotional disturbances*. It is reported that the Chinese of ancient times based their "rice-test"¹³ on this very principle. And to this day in India it is a prevalent belief that the movement of the big toe of the witness is a sure indication of deception.¹⁴

During the past thirty years, deception tests of a more scientific nature have been conceived. The psychologists and physiologists have made offer of such tests as the Jung association word-reaction time test,¹⁵ the Benussi respiratory, or inspiration-expiration, ratio test,¹⁶ the Marston systolic blood pressure test,¹⁷ and the Keeler polygraph.¹⁸ These tests are all predicated on the recording of various indicia of emotion and interpretations of the records thus obtained. Interpretation is based, in part, upon a comparison of the tested person's "normal" response record, as obtained during a preliminary examination (consisting of immaterial and "background" questions), with the record obtained during a subsequent examination (consisting of material and immaterial questions).¹⁹

Although these deception tests "seem to be accepted by psycholo-

¹² *Quercia v. United States*, 289 U. S. 466, 53 Sup. Ct. 698 (1933).

¹³ " * * * the Chinese used an ancient method by which the suspect was made to chew rice and then spit it out for examination. If the rice appeared dry, the suspect was considered guilty, the basis of the conclusion being that his fear of detection was supposed to inhibit the secretion of saliva." Venters, *Use of Lie Detectors* (1935) 39 LAW NOTES 23.

¹⁴ Larson, *The Berkeley Lie Detector and Other Deception Tests* (1922) 47 A. B. A. REP. 619.

¹⁵ MUNSTERBERG, ON THE WITNESS STAND (1909) 73. The impracticability of this test for court-room use was illustrated in Wigmore, *Professor Munsterberg and the Psychology of Testimony* (1909) 3 ILL. L. REV. 399.

¹⁶ This test depends upon the correlation between respiratory changes and conscious deception. See 4 J. OF EXPERIMENTAL PSYCH. 1, for an extended discussion of this test. At present, this test is not used independently but is used in conjunction with the blood pressure test.

¹⁷ Records of changes in the systolic blood pressure are used in an attempt to diagnose deception. For a discussion of the underlying theory, see Note (1933) 13 B. U. L. REV. 321, 322.

Professor Wigmore has indicated that this is the sole test which has demonstrated any utility. (1938) 86 U. OF PA. L. REV. 903. It is reported in Esquire, April, 1935, that he has "suggested that an enlarged blood-pressure indicator like a thermometer might be devised and set up in the court room, thus enabling the jury to observe directly the fluctuations of a witness' blood pressure while he tells his story on the stand"; cf. Forkosh, *The Lie Detector and the Courts* (1939) 16 N. Y. U. L. Q. 202, 215, where it is said: "The fact that * * * an occasional innocent person showed even moderate symptoms of guilt indicates the hazard of trusting too implicitly in the results of these tests."

¹⁸ This apparatus records the changes in the respiration, pulse pressure and pulse rate. See Hoover, *Scientific Methods of Crime Detection in the Judicial Process* (1935) 4 GEO. WASH. L. REV. 1, 24.

¹⁹ For a detailed description of the usual procedure followed, see Forkosh, *op. cit. supra* note 17, at 213 *et seq.*

gists generally as being based upon a sound underlying theory",²⁰ not one of these has been received with anything resembling unanimity, and this, even "in the house of their friends", the psychologists and the physiologists.²¹

In 1923, a trial court's refusal of the first offer of expert testimony based on a systolic blood pressure test was upheld in a federal court.²² In 1929, an attempt to use this test on a recalcitrant defendant resulted only in his smashing of the apparatus.²³ Four years later, the polygraph, an alleged (by its proponents) improvement on the systolic blood pressure test, was denied legal recognition as a proper basis for expert testimony by the highest court of Wisconsin.²⁴

The "perfection" of the pathometer, the latest deception test, and the conflict it has produced in our lower courts, has placed New York in the center of the deception-detection stage. This new device is unique in that it records the electrical phenomena developed on the body surface during emotional changes.²⁵ Expert interpretation of a pathometrical examination was admitted in *People v. Kenny*.²⁶ Hard on the heels of this decision came the refusal of a motion for a similar examination in the *Forte* case.²⁷ This determination necessitated an appellate review which resulted in a holding by the Court of Appeals that no error was committed in refusing to allow the defendant to experiment with the pathometer.²⁸ The reason assigned for this was

²⁰ See McCormick, *Deception Tests and the Law of Evidence* (1927) 15 CALIF. L. REV. 484, 485.

²¹ See the answers to a questionnaire sent to eighty-eight members of the American Psychological Association in McCormick, *op. cit. supra* note 20, at 495 *et seq.*

²² *Frye v. United States*, 293 Fed. 1013 (App. D. C. 1923), noted in Comment (1924) 33 YALE L. J. 771; reviewed in (1924) 24 COL. L. REV. 429 with approval; (1924) 37 HARV. L. REV. 1138 (value of any psychological test seems questionable unless the average juror becomes extremely discriminating).

²³ See record in *State v. Mayer*, Superior Court of Kings County, Wash., Nov. 23, 1929 (unreported), mentioned in Note (1931) 44 HARV. L. REV. 842.

²⁴ *State v. Bohner*, 210 Wis. 65, 246 N. W. 314 (1933), discussed in Inbau, *Scientific Evidence in Criminal Cases* (1935) 2 LAW & CONTEMP. PROB. 495, 502; discussed in Note (1933) 13 B. U. L. REV. 321.

²⁵ The underlying principles are ably discussed in Forkosh, *op. cit. supra* note 17, at 205 *et seq.*; *cf.* (1939) 8 FORDHAM L. REV. 120, 121; (1938) 86 U. OF PA. L. REV. 903.

For a description of the pathometer and the circuit see Forkosh, *id.* at 212 *et seq.*

²⁶ 167 Misc. 51, 3 N. Y. S. (2d) 348 (Queens County Ct. 1938). This decision received implied approval in Note (1938) 16 CHI-KENT REV. 269 and in (1939) 8 FORDHAM L. REV. 120.

However, the more complete and better considered analyses reach an opposite conclusion. Forkosh, *op. cit. supra* note 17; (1938) 29 J. CRIM. L. 287.

²⁷ *People v. Forte*, 167 Misc. 868, 4 N. Y. S. (2d) 913 (Kings County Ct. 1938).

The Forkosh article (see *supra* note 17) was incorporated in the minutes of this case, so as to form part of the record on appeal.

²⁸ *People v. Forte*, 279 N. Y. 204, 18 N. E. (2d) 31 (1938), reviewed in (1939) 8 FORDHAM L. REV. 120.

that the record was devoid of evidence that the pathometer is generally recognized by scientists "as possessing such value that reasonable certainty can follow from tests [made with it]." ²⁹

But a few sentences are necessary to bring home the soundness of this opinion. The inherent weakness in every test for deception—in the ancient Chinese "rice-test", in the systolic blood pressure test, in the test dependent on the pathometer—is that a human being ³⁰ must evaluate data revealed by some technique which itself is used only "to diagnose hypothetical subjective occurrences." ³¹ Inasmuch as the tests depend largely on double diagnosis, varying inferences may be drawn. ³² And the extravagant claims of "infallibility", usually varying from 94% to 98%, ³³ must be recognized as either proponent-puffing or the results of wishful experimentation. The pathometer, in addition, has attracted much particular criticism. So:

1. Although the instrument works upon the electrical changes developed on the surface of the skin during emotional reactions, "there is neither unanimity nor even approximate agreement upon the general principles embraced within the field of bodily surface electrical phenomena." ³⁴
2. The reliability of the pathometer is to be questioned "inasmuch as it records emotional reactions other than those produced by lying, such as fear and excitement." ³⁵
3. A sufficient number of experiments under actual conditions have not been conducted. ³⁶
4. The results obtained in the forty-nine actual cases in which it has been used have not been scientifically checked. ³⁷
5. The Staff of the Scientific Crime Detection Laboratory of Northwestern University, using a substantially similar instrument in connection with two other recognized tests, has made no claims of infallibility. ³⁸
6. There is no general scientific recognition of the reliability of the pathometrical tests, "especially since they are not known to any but a few * * *." ³⁹

It is to be noted that the court, in refusing to notice judicially that reasonable certainty follows from these tests, relied only upon this last objection.

Mingled feelings of admiration and confusion are experienced by

²⁹ *People v. Foote*, 279 N. Y. 204, 205, 18 N. E. (2d) 31 (1938).

³⁰ "The importance of the individual skill in cross-examination of the person giving the test was apparent * * *." McCormick, *op. cit. supra* note 20, at 489; *cf.* 1 WIGMORE, *op. cit. supra* note 3, § 156 (the Bertillon anthropometric system of personal identification was greatly weakened and has been practically discarded because of this same element of uncertainty).

³¹ See Forkosh, *op. cit. supra* note 17, at 225.

³² *Cf. People v. Kenny*, 167 Misc. 51, 54, 3 N. Y. S. (2d) 348, 351 (1938), where it was said: "In this case we are dealing with a science from which varying inferences may not be drawn."

³³ See McCormick, *loc. cit. supra* note 20; (1938) 29 J. CRIM. L. 287, 289.

³⁴ Forkosh, *op. cit. supra* note 17, at 231.

³⁵ (1938) 86 U. OF PA. L. REV. 903, 904; so also, MARSTON, *THE LIE DETECTOR TEST* (1938) 39 *et seq.*

³⁶ (1938) J. CRIM. L. 287, 290.

³⁷ *Id.* at 289.

³⁸ *Id.* at 290.

³⁹ Forkosh, *loc. cit. supra* note 34.

the layman when he learns that there are suggested and available still other tests for deception. For example, there is the bulb-apparatus test for muscular reflexes.⁴⁰ And "some physiologists assert that biochemical analysis of the blood for the presence of potassium, calcium, and adrenal and other endocrine gland excretions, may hold the secret to the answer sought."⁴¹

It is interesting to speculate re: the implications that would follow from the perfection of a nearly infallible lie detector. Sound comment has it that the privilege against self-incrimination would not constitute a bar to the general use of such device.⁴² However, since the present jury system would be rendered obsolete,⁴³ general acceptance would have to be delayed until an entirely new system of procedure could be formulated.

Two questions of more acute interest suggest themselves. First: Have the present types of deception tests any forensic utility? Of indirect utility is the use of such tests by police departments and prosecutors in the preliminary investigation and examination of suspects.⁴⁴ In Wisconsin, expert testimony and the records of lie detector examinations have been received in evidence where the opposing counsel stipulated in advance to accept the results of such tests.⁴⁵ The second question is: assuming that, as a result of many thousands of experiments with all types of temperaments under varying conditions, science does recognize a lie detector as reasonably reliable, for what purpose will it be used forensically? It would probably be used to impeach and to rehabilitate witnesses.⁴⁶ Expert testimony regarding scientific examinations for deception will aid the jury in determining whether or not a principal witness is worthy of belief.⁴⁷ Parties to

⁴⁰ See Hoover, *loc. cit. supra* note 18.

⁴¹ Hoover, *op. cit. supra* note 18, at 25.

⁴² Inbau, *Self-Incrimination—What Can an Accused Person Be Compelled to Do?* (1937) 28 J. CRIM. L. 261, 287; McCormick, *op. cit. supra* note 20, at 502; N. Y. L. J., Oct. 5, 1935, p. 1134; Note (1938) 13 NOTRE DAME LAWY. 212, 214; (1924) 37 HARV. L. REV. 1138; *cf.* Note (1938) 16 CHI-KENT REV. 269, 271.

⁴³ "If such tests ever are adopted, it is probable that the jury system will have to be abandoned * * *." Chafee, *The Progress of the Law, 1919-1921* (1922) 35 HARV. L. REV. 302, 309; *cf.* Forkosh, *op. cit. supra* note 17, at 202.

⁴⁴ McCormick, *op. cit. supra* note 20, at 501; (1939) 8 FORDHAM L. REV. 120, 121; *cf.* WIGMORE, *op. cit. supra* note 3, § 314.

⁴⁵ For a discussion of these cases see Inbau, *Detection of Deception Technique Admitted in Evidence* (1935) 26 J. CRIM. L. 262; (1936) 26 *id.* 758; *cf.* MARSTON, *op. cit. supra* note 35, at 69 (mention of unreported cases in Illinois, Indiana, and Ohio admitting testimony re: blood pressure tests).

⁴⁶ See Strahorn, *Extra-Legal Materials and the Law of Evidence* (1934) 29 ILL. L. REV. 300, 323; McCormick, *op. cit. supra* note 20, at 502 (corroboration and impeachment).

⁴⁷ "It must be borne in mind that the use of 'lie detectors' is not to establish any independent fact in issue; its primary, indeed its sole purpose, is to demonstrate that the defendant is worthy of belief. It is a device which tends to sustain or discredit the defendant's credibility." *People v. Forte*, 167 Misc. 868, 869, 4 N. Y. S. (2d) 913, 914 (1938).

civil and criminal actions will submit to the tests rather than have the jury's attention directed to a refusal.⁴⁸ Many difficulties will arise concerning the questions to be used in the tests.⁴⁹ In light of a poll of the jury in the *Kenny* case⁵⁰ which revealed that five jurors accepted such expert testimony without hesitation,⁵¹ it would be well to remember that both the burden of coming forward with experimental data and the burden of proving the reliability and the general scientific recognition of deception tests lies with the psychologists and the physiologists and not with the judiciary.⁵²

In discussing that permanent problem of the law, the faithful reconstruction of past events, Radin has remarked: " * * * even if they [the lie detectors] were all completely trustworthy, they would provide only half a solution, or somewhat less than half. It is not enough to know whether a man is lying, but it is necessary to compel him to tell the truth."⁵³ Compelling a man "to tell the truth, the whole truth, and nothing but the truth" necessarily involves a temporary inhibition of the reasoning processes. To accomplish this the physiologist uses a so-called truth-serum, a harmless anaesthetic which induces a "twilight-sleep", which is the popular description of "a mental state where consciousness is affected to the extent * * * " that the subject makes automatic and unreasoned responses to questions.⁵⁴ A comparatively small amount of experimentation in this field has produced fairly successful results.⁵⁵ However, when the results of one such experiment were offered in evidence to exonerate a defendant, they were held inadmissible as self-serving statements and truth-serum was dismissed as "clap-trap".⁵⁶

⁴⁸ Cf. N. Y. CODE CRIM. PROC. § 684, effective April 2, 1938. Serologic Blood Tests. " * * * Whenever the court orders such serologic blood tests to be made and one of the parties shall refuse to submit to such test, such fact shall be disclosed upon the trial unless good cause is shown to the contrary."

⁴⁹ Cf. *People v. Forte*, 167 Misc. 868, 4 N. Y. S. (2d) 913 (1938).

⁵⁰ *People v. Kenny*, 167 Misc. 51, 3 N. Y. S. (2d) 348 (1938).

⁵¹ Forkosh, *op. cit. supra* note 17, at 228 *et seq.* (poll of members of *Kenny* jury by author revealed that five members of that jury accepted testimony based on a pathometer test for deception "without hesitation" and did not "evaluate it in the light of the entire testimony.").

⁵² Professor Chafee's statement made in 1922 is well worth repeating today, "Lawyers will await the results of such investigations with open minds * * *." Chafee, *loc. cit. supra* note 43.

⁵³ Radin, *op. cit. supra* note 1, at 4, 5.

⁵⁴ See Inbau, *Methods of Detecting Deception* (1934) 24 J. CRIM. L. 1140, 1153.

⁵⁵ House, *Why Truth Serum Should Be Made Legal* (1925) 42 MED. LEG. J. 138 (50% accuracy); Inbau, *op. cit. supra* note 42, at 288 ("Although some fairly encouraging results have been obtained * * * experimentally and even in actual criminal investigations the percentage of accuracy at the present time is not very high."); McCormick, *op. cit. supra* note 20, at 493, where the author observes: "The great superiority of this method if valid, is that * * * its results are not dependent upon any question of interpretation * * * [but] * * * it has never received tests adequate to enable judgment to be passed upon it."

⁵⁶ *State v. Hudson*, 289 S. W. 920 (Mo. 1926). That part of the opinion dealing with truth-serum is strictly a literary attempt; no attempt is made to

The psychologist in his attempt to elicit truth relies on hypnosis. Evidence thus obtained has been held inadmissible in England.⁵⁷ The theory is that such evidence is both involuntary and unreliable.⁵⁸

So it is that we realize that science has offered little aid in either the uncovering or uprooting of bias and the motive to lie. The only tools available for this task are the common law tests of credibility⁵⁹ and "that great legal machine", cross-examination.

Experts and the Scientific Expert.

In reconstructing past events the jury often require special assistance. Lay possessions prove insufficient to cope with highly specialized matters. Special experience must be and is drafted to aid the jury in drawing intelligent inferences. Such assistance would seem to be as invaluable as it is indispensable. Yet we read that expert testimony is to be given "hardly any weight",⁶⁰ "is disparaged",⁶¹ and "is regarded * * * as the weakest character of testimony";⁶² that expert testimony "should be received with 'caution'",⁶³ and with "narrow scrutiny";⁶⁴ that expert testimony "is subject to judicial suspicion"⁶⁵ and is the "object of proposed reform";⁶⁶ that "the tendencies of the courts are constantly inclining in the direction of narrowing the rule of its introduction";⁶⁷ and that "it is generally safer to take the judgment of unskilled jurors".⁶⁸ This fall into disrepute is usually attributed to our party system of experts,⁶⁹ a natural by-product of our adversary system of litigation. The vicious cycle of expert

understand the effect scopolamine has on the mind. Cf. Note (1931) 44 HARV. L. REV. 842, 845.

⁵⁷ Rex v. Booker (1928) 4 D. L. R. 795 (confession probably induced by hypnotism held inadmissible).

⁵⁸ (1929) 42 HARV. L. REV. 704 (analogy is made to confessions obtained during sleep).

⁵⁹ Howard v. Louisville Ry., 32 Ky. 309, 105 S. W. 932 (1907) (physical appearance, mannerisms, consistency of statements); cf. Boykin v. People, 22 Colo. 496, 45 Pac. 419 (1896) (blushing, squinting of the eyes, twitching, squirming, throat pulsations, verbosity, avoiding eyes of examiner).

⁶⁰ Tracy Peerage Case (1843) 10 Cl. & F. 154.

⁶¹ Note (1923) 36 HARV. L. REV. 333, 334.

⁶² Kentucky Traction Co. v. Humphrey, 168 Ky. 611, 182 S. W. 854, 856 (1916).

⁶³ 17 Cyc. 267.

⁶⁴ *Ibid.*

⁶⁵ O'TOOLE, CASES AND MATERIALS ON EVIDENCE (2d ed. 1937) 974.

⁶⁶ Yerion, *Expert Medical Testimony in Compensation Proceedings* (1935) 2 LAW & CONTEMP. PROB. 476.

⁶⁷ See note 62, *supra*.

⁶⁸ Ferguson v. Hubbell, 97 N. Y. 507, 514 (1884).

⁶⁹ Overholser, *The Place of Psychiatry in the Criminal Law* (1936) 16 B. U. L. REV. 322; Terman, *Psychology and the Law* (1935) 40 COMMERCIAL L. J. 639; Yerion, *op. cit. supra* note 66, at 478; Note (1923) 36 HARV. L. REV. 333.

testimony starts with the employment and payment of different experts by the parties,⁷⁰ develops with resultant partisanship and venality,⁷¹ and closes with highly conflicting and confusing technical verbiage.⁷² One may well query: "Who shall decide when doctors disagree?"⁷³

The "do-next-to-nothing" approach to this problem relies on the disparagement and restriction of expert testimony.⁷⁴ The drafting of the Uniform Expert Testimony Act⁷⁵ and the enactment of remedial legislation in a number of states⁷⁶ represent the more positive approach. This approach attacks the evils of partisanship by providing for the court appointment of neutral and disinterested experts in addition to the party experts.⁷⁷ Setting to one side available criti-

⁷⁰ O'TOOLE, *loc. cit. supra* note 65; Terman, *loc. cit. supra* note 69; Note (1923) 36 HARV. L. REV. 333 (payment of contingent fees).

⁷¹ In *Kentucky Traction Co. v. Humphrey*, 168 Ky. 611, 182 S. W. 854, 856 (1916), the court said: " * * * there exists experts following the business of bartering their expert or scientific knowledge to the litigant who can pay the highest price." So also, Overholser, *loc. cit. supra* note 69; Overholser, *The History and Operation of the Briggs Law of Massachusetts* (1935) 2 LAW & CONTEMP. PROB. 436; cf. Hulbert, *Psychiatric Testimony in Probate Proceedings* (1935) 2 LAW & CONTEMP. PROB. 448.

⁷² See Shientag, *A Ministry of Justice in Action—The Work of the New York State Law Revision Committee* (1937) 22 CORN. L. Q. 183, 192; Britt, *Blood-Grouping Test and the Law*, "The Problem of 'Cultural Lag'" (1937) 21 MINN. L. REV. 671, 698; Osborn, Book Review (1924) 37 HARV. L. REV. 787; Note (1923) 36 HARV. L. REV. 333, 334.

⁷³ It is said that Alexander Pope was the first to pose this question. Cf. Hand, *Historical and Practical Consideration Regarding Expert Testimony* (1901) 15 HARV. L. REV. 40, 54.

⁷⁴ *Brehm v. The Great Western R. R.*, 34 Barb. 256 (N. Y. 1861); *People v. Barberi*, 12 N. Y. Cr. R. 89, 47 N. Y. Supp. 168 (1896).

⁷⁵ THE UNIFORM EXPERT TESTIMONY ACT, approved by the National Conference of Commissioners on Uniform State Laws (47th Annual Conference, 1937); Legis. (1938) 38 COL. L. REV. 369.

⁷⁶ See Legis. (1938) 38 COL. L. REV. 369, n.8 at 370 for a list of eight statutes. See also R. I. GEN. LAWS (1923) §§ 5002-5005; CAL. CODE OF CIVIL PROCEDURE (Deering, 1931) § 1871 (court appointment of neutral experts in both civil and criminal cases); cf. N. Y. CODE CRIM. PROC. §§ 658, 659 (on plea of not guilty by reason of insanity, court may appoint a commission of three "disinterested persons" to examine defendant and report to the court); Note (1929) 38 YALE L. J. 368; N. Y. CODE CRIM. PROC. § 836, as am'd. Laws of 1933, c. 564.

Probably the most advanced and best conceived system of selecting mental experts is found in the so-called Briggs Law, MASS. ANN. LAWS (Michie, 1933) c. 123, § 100-A.

Also see N. Y. LEGIS. DOC. NO. 65 (1936) 801 (proposal for reform of expert testimony in personal injury actions). Proposal failed of passage, see *id.* at 1028.

⁷⁷ Cf. Hand, *The Deficiencies of Trials to Reach the Heart of the Matter* (1921-22) (N. Y. City Bar Ass'n Lectures on Legal Topics, pub. 1926, vol. III) at 103: "My thesis is that * * * help should come * * * from an assistant who can inform them and not from one who inevitably * * * must take on the attitude of a partisan."

cism⁷⁸ and questions of constitutionality,⁷⁹ and assuming that the result of this reform will be the complete elimination of biased expert testimony, the question still remains as to whether such testimony will always be unconflicting. Will the absence of partisanship make for substantial agreement in the testimony of doctors and psychiatrists? The second question answers the first. Medical science is not exact;⁸⁰ psychiatry is more of an art than a science.⁸¹ In these fields, general principles cannot often be applied with mathematical certainty.⁸² Opinions offered are generally based on hypothesis or symptoms of fact rather than on actual facts. Because there is much room for honest differences of opinion in medicine and psychiatry,⁸³ conflicting expert testimony will persist. Furthermore, since these classes of expert testimony are not frequently "susceptible of illustration and explanation so as to be weighed by the ordinary hearer",⁸⁴ the jury will in many instances be precluded from making an intelligent choice.

However, there is available a class of expert helpers which is characterized by an almost complete lack of conflict, and this, because of its exactitude.⁸⁵ The possibility of assistance of this nature was recognized as long ago as 1795 by a text writer who in his treatment of "Proof by Experts" observed: "In proportion as Experience and Science advances, the uncertainty and danger from this kind of proof

⁷⁸ See Legis. (1938) 38 COL. L. REV. 369 (only minimizes the evils of partisanship; appointment only in discretion of trial judge; no prescribing of qualifications; no elimination of "hypothetical question").

⁷⁹ *People v. Dickerson*, 164 Mich. 148, 129 N. W. 199 (1910) (holding Mich. Statute unconstitutional), criticized in 5 WIGMORE, *op. cit. supra* note 4, § 2484; *cf. People v. Strong*, 114 Cal. App. 522, 300 Pac. 84 (1931); *Jessner v. State*, 202 Wis. 184, 231 N. W. 634 (1930).

⁸⁰ Robertson, *Medico-Legal Evidence* (1938) 16 CAN. B. REV. 185; Taft, *Opinion Evidence of Medical Witnesses* (1927) 14 VA. L. REV. 81; *cf. Clark v. Baird*, 9 N. Y. 183, 194 (1853).

For one case where medical testimony was exact see *Mitchell v. Buffalo Cold Storage Co.*, 252 App. Div. 715, 298 N. Y. Supp. 800 (3d Dept. 1937).

⁸¹ See 19 ENCYC. OF SOC. SCI. 58.

⁸² See *People v. Barberi*, 12 N. Y. Cr. R. 89, 47 N. Y. Supp. 168, 173 (1896).

⁸³ Taft, *op. cit. supra* note 80, at 87; Yerion, *op. cit. supra* note 66, at 477; *cf. McDonough v. Metro. Life Ins. Co.*, 228 Mass. 450, 117 N. E. 836, 838 (1917), wherein the court, referring to medical expert testimony, said: "The single circumstance that it was uncontradicted is not enough to compel belief in its accuracy."

⁸⁴ Osborn, *Reasons and Reasoning in Expert Testimony* (1935) 2 LAW & CONTEMP. PROB. 488, 489; *cf. People v. Youngs*, 151 N. Y. 210, 45 N. E. 460 (1896).

⁸⁵ "Many lawyers argue glibly that expert testimony is 'always in conflict'. This is not true of much technical expert testimony." OSBORN, *op. cit. supra* note 84, at 492.

For a comparison of degrees of definiteness found in expert testimony based on chemistry, physics, and medicine see WIGMORE, *op. cit. supra* note 3, § 231; *cf. id.* § 294.

diminishes * * *"⁸⁶ One hundred and forty years later, the words, "The guilt of the defendant is as conclusively established as it is possible for it to be", were uttered by a court in a criminal case wherein the only evidence offered against the defendant was supplied by experts.⁸⁷ In this wise it becomes apparent that the most helpful contribution of science to the solution of the problem of reconstructing past events has been *the truly scientific expert*.

The scientific expert brings to the attention of the tribunal facts which can be perceived only by either the use of instruments which offer mechanical aid to the senses or by investigations based on the invariable laws of chemistry.⁸⁸ By applying understandable principles of varying universality the scientific expert makes more usable the facts thus perceived. On this base of scientifically perceived facts and by the application of these principles are the conclusions of the truly scientific expert fashioned. Thus it is that it can be said " * * * fingerprint identification is an exact science, and that therefore there can be no honest differences of opinion on the part of competent experts."⁸⁹

Trial court procedure has been adjusted so as to permit a more effectual presentation of this "evidence of the highest rank".⁹⁰ A scientific expert is now required to describe and detail the factual base of his conclusion.⁹¹ He may outline step by step the reasoning which leads to his conclusion.⁹² Since his testimony is susceptible of demonstration he may explain, illustrate and compare.⁹³ Use may be made of crayon and pencil or of a blackboard.⁹⁴

⁸⁶ Found in GILBERT, *THE LAW OF EVIDENCE* (edition of Capel Lofft, Dublin, 1795); Hand, *op. cit. supra* note 73, at 47.

⁸⁷ *Magnuson v. State*, 187 Wis. 122, 203 N. W. 749 (1925).

⁸⁸ "Perception by scientific processes" means that by aid of such processes we can add to our knowledge other data not discernible by the unaided senses, or can make more accurate and more usable the data already discernible." WIGMORE, *op. cit. supra* note 3, § 220.

⁸⁹ Shaw, *Fingerprints for the Lawyer* (1930) 4 TEMP. L. Q. 227, 237.

⁹⁰ *Boyd v. Gosser*, 78 Fla. 70, 82 So. 758 (1919).

⁹¹ "The amount of importance to be attached to what the experts say depends entirely upon the factual basis for their conclusion." *Hahn v. Duveen*, 133 Misc. 871, 234 N. Y. Supp. 185 (1929).

People v. Roach, 215 N. Y. 592, 604, 109 N. E. 618, 623 (1915) ("the witness * * * specified the circumstances upon which he predicated his opinion"); *Fekete v. Fekete*, 323 Ill. 468, 154 N. E. 215 (1926); *cf. Note* (1934) 9 ST. JOHN'S L. REV. 102, 103; *cf. Hoover, op. cit. supra* note 18, at 4.

⁹² "It is obvious that if an expert opinion is to be properly weighted and considered by the hearer, the reasoning process itself must be outlined * * *." Osborn, *op. cit. supra* note 84, at 489; *Venuto v. Luzzo*, 148 App. Div. 164, 132 N. Y. Supp. 1066 (1st Dept. 1911); *In re Koch*, 33 Misc. 153, 68 N. Y. Supp. 375 (1900); (1927) 31 LAW NOTES 84.

⁹³ *Commonwealth v. Best*, 180 Mass. 492, 62 N. E. 748 (1902) (ballistics); *McGrath v. Fash*, 244 Mass. 327, 139 N. E. 303 (1923) (comparison of X-ray plates); *State v. Cerciello*, 86 N. J. L. 309, 90 Atl. 1112 (1914) (fingerprints); see Inbau, *Finger Prints and Palm Prints* (1935) 25 J. CRIM. L. 500, 507; *Goddard, Scientific Identification of Firearms and Bullets* (1926) 17 J. CRIM. L. 254, 262.

⁹⁴ *Rogers, Progress in Proof of Handwriting* (1935) 30 LAW NOTES 47

Photographs and enlargements of photographs may be presented for jury inspection.⁹⁵ Lantern slides and the projectoscope may be employed.⁹⁶ The jury may look through a microscope.⁹⁷ The scientific expert may conduct experiments in the court-room.⁹⁸ Thus, a sensible procedure has evolved which assists the jury to complete understanding on highly specialized matters. Because the jury are enabled to follow and understand they are equipped to weigh intelligently and, therefore, to make the best possible use of expert scientific testimony. Even if conflict occasionally does arise, the jury can now distinguish between the charlatan and the competent scientific expert.⁹⁹

A reviewer has said that "Waiting for the advent of an absolutely infallible lie detector is like waiting for the irrefutable proof."¹⁰⁰ The analogy is not particularly apt. Happily, we can discern faintly, at least, the arrival of traces of "the irrefutable proof" in certain cases involving scientific expert testimony concerning such matters as micro-analysis,¹⁰¹ fingerprints,¹⁰² palmprints,¹⁰³ sole prints,¹⁰⁴ ballistics,¹⁰⁵

(crayon and paper); *McKay v. Lasher*, 121 N. Y. 477, 24 N. E. 711 (1890) (blackboard illustrations); cf. Walker, *The Blackboard and Criminal Defenses* (1937) 43 CASE AND COMMENT 14.

⁹⁵ *Hoffman v. Prussian Nat. Ins. Co.*, 181 App. Div. 412, 168 N. Y. Supp. 841 (2d Dept. 1918) (photographic enlargements of handwritings); *Scott v. Thrall*, 77 Kan. 68, 95 Pac. 563 (1908) (photographs of writings); *Lamble v. State*, 96 N. J. L. 231, 114 Atl. 346 (1921) (photographs of fingerprints); *Adams v. Ristine*, 138 Va. 273, 132 S. E. 126 (1924) (photographic enlargements of writings); *Osborn, Progress in Proof of Handwriting and Documents* (1933) 24 J. CRIM. L. 118; *Inbau, Firearms Identification in "Ballistics"* (1934) 24 J. CRIM. L. 825. *Contra*: *Taylor Will Case*, 10 Abb. Prac. Rep. 300 (N. Y. 1871).

In *Hoag v. Wright*, 174 N. Y. 36, 66 N. E. 579 (1903), the court observed: "This method [using photographs] makes a strong appeal on lay minds."

⁹⁶ *State v. Kuhl*, 42 Nev. 185, 175 Pac. 190 (1918) (photographs of palm prints projected on screen).

⁹⁷ 2 WIGMORE, *op. cit. supra* note 4, § 1152; cf. *Frank v. Chemical Nat. Bank*, 45 Super. Ct. 452 (N. Y. 1879).

⁹⁸ *Moon v. State*, 22 Ariz. 418, 198 Pac. 288 (1921) (expert demonstrated how he obtained fingerprints from blank paper); *People v. Chimovitz*, 237 Mich. 247, 211 N. W. 650 (1927) (expert allowed to make prints of the jury to illustrate fingerprint identification); *Stacy v. State*, 49 Okla. Crim. 154, 292 Pac. 885 (1930); cf. *People v. Constatino*, 153 N. Y. 24, 47 N. E. 37 (1897).

⁹⁹ " * * * what scientific methods and apparatus has been able to do is to reveal facts, and the facts can be made, by microscoping and photography, as plain to the tribunal as to the expert; so that the observer may form his own opinion adequately from these facts." Wigmore, *Modern Chirographic Science as Applied to Detect Typed Frauds* (1926) 21 ILL. L. REV. 299, 301 [review of *Lyon v. Oliver*, 316 Ill. 292, 148 N. E. 251 (1926)]; cf. *Magnuson v. State*, 187 Wis. 122, 203 N. W. 749 (1925).

¹⁰⁰ (1939) 8 FORDHAM L. REV. 120, 122.

¹⁰¹ *People v. Wallace*, 353 Ill. 30, 186 N. E. 540 (1933); *Magnuson v. State*, 187 Wis. 122, 203 N. W. 749 (1925).

¹⁰² *People v. Roach*, 215 N. Y. 592, 109 N. E. 618 (1915); *Moon v. State*, 22 Ariz. 418, 198 Pac. 288 (1921); *People v. Jennings*, 252 Ill. 534, 96 N. E. 1077 (1911); *Stacy v. State*, 49 Okla. Crim. 154, 292 Pac. 885 (1930); cf. Note (1932) 80 U. OF PA. L. REV. 887 (fingerprints can be forged; cautions

questioned handwriting,¹⁰⁶ questioned typewriting,¹⁰⁷ document examination,¹⁰⁸ radiographs,¹⁰⁹ photomicrographs,¹¹⁰ spectrographs,¹¹¹ chemical analysis,¹¹² blood grouping tests,¹¹³ and scientific tests for intoxication.¹¹⁴

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against over-evaluation); but cf. Lee, *Further Discussion of the Evidentiary Value of Fingerprints* (1933) 81 U. OF PA. L. REV. 320.

For a review of leading cases and a general discussion, Inbau, *Finger Prints and Palm Prints* (1935) 25 J. CRIM. L. 500.

¹⁰³ State v. Kuhl, 42 Nev. 185, 175 Pac. 190 (1918); State v. Lapan, 101 Vt. 124, 141 Atl. 686 (1928); People v. Les, 267 Mich. 648, 255 N. W. 407 (1934).

¹⁰⁴ Commonwealth v. Bartolini, 13 N. E. (2d) 382 (Mass. 1938), *cert. denied*, 304 U. S. 565, 58 Sup. Ct. 950 (1938). Sole prints are not to be confused with footprints, see (1938) 12 U. OF CIN. L. REV. 611.

¹⁰⁵ People v. Fisher, 340 Ill. 216, 172 N. E. 734 (1930); People v. Richardson, 251 App. Div. 916, 297 N. Y. Supp. 514 (3d Dept. 1937); see Goddard, *loc. cit. supra* note 93; Inbau, *loc. cit. supra* note 95.

¹⁰⁶ Boyd v. Gasser, 78 Fla. 70, 82 So. 758 (1919); see OSBORN, *QUESTIONED DOCUMENTS* (2d ed. 1929).

¹⁰⁷ People v. Storrs, 207 N. Y. 147, 100 N. E. 730 (1912); People v. Risley, 214 N. Y. 75, 108 N. E. 200 (1915); People v. Werblow, 212 App. Div. 445, 209 N. Y. Supp. 88 (1st Dept. 1925); see Osborn, *Fraudulent Typewriting in Legal Documents* (1934) 20 A. B. A. J. 708.

¹⁰⁸ Matter of Hopkins, 172 N. Y. 360, 65 N. E. 173 (1902) (age of ink); *In re Oliver's Will*, 126 Misc. 511, 214 N. Y. Supp. 154 (1926) (paper); *In re Jackson's Estate*, 127 Misc. 187, 215 N. Y. Supp. 230 (1926); *In re Wendel's Estate*, 146 Misc. 260, 262 N. Y. Supp. 41 (1933) (watermark); Lyon v. Oliver, 316 Ill. 292, 147 N. E. 251 (1925) (chemical erasure).

¹⁰⁹ State v. Matheson, 130 Iowa 44, 103 N. W. 137 (1905) (X-ray photo introduced to illustrate presence and position of bullet); State v. Casey, 108 Ore. 386, 213 Pac. 77 (1923) (wound on arm); see also Leone v. Booth Steamship Co., 232 N. Y. 183, 185, 133 N. E. 439 (1921) (fracture).

¹¹⁰ People v. McDonald, 365 Ill. 233, 6 N. E. (2d) 182 (1936); State v. Clark, 156 Wash. 543, 287 Pac. 18 (1930); Magnuson v. State, 187 Wis. 122, 203 N. W. 749 (1925).

¹¹¹ State v. Kennedy (N. Y. 1933) (unreported) discussed at length in Wilson, *Spectrographic Analysis as an Aid in Identification Problems* (1934) 25 J. CRIM. L. 160.

¹¹² People v. Roach, 215 N. Y. 592, 109 N. E. 618 (1915); State v. Johnson, 37 N. M. 280, 21 P. (2d) 813 (1933); cf. Hand v. State, 26 Ala. App. 317, 159 So. 275 (1935).

¹¹³ State v. Wright, 591 Ohio App. 191, 17 N. E. (2d) 428 (1938). *Contra*: Arais v. Kalensnikoff, 95 Cal. Dec. 4, 74 P. (2d) 1043 (1937), criticized in Britt, *Blood-Grouping Tests and More "Cultural Lag"* (1938) 22 MINN. L. REV. 836, 839, where it is observed: "With scientific evidence unavailable, however, the court's decision should never have rested on matters of verbal testimony."

¹¹⁴ Cf. Ladd and Gibson, *The Medico-Legal Aspects of the Blood Test to Determine Intoxication* (1939) 24 IOWA L. REV. 191.